ECTEL's Price Cap Regime

A Preliminary Report

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Introduction:

May 20, 2002, as a further step towards liberalizing telecommunication in the OECS, ECTEL countries signed an agreement with C&W whereby the company would provide basic telecommunication services at prices no greater than an agreed upon schedule of prices. The services that the agreement encompassed included domestic fixed to mobile calls, domestic fixed telephone services, and international direct dial calls among ECTEL states, and between ECTEL states and other Caribbean countries. The agreement also stipulated that this pricing arrangement would remain in place until the NTRCs introduce price cap regulation.

Price cap regulation prescribes limits on the price changes of a regulated operator's services for a specified time period. The regulation is intended to induce behavior that mirrors what would obtain in a competitive environment. One such behavior is that, to remain viable, firms in a competitive industry have to continuously improve their productivity and, after adjustments for changes in input cost, pass on these gains to consumers in the form of lower prices. Price cap regulation pursue those same results by making allowances for operators to recover unavoidable cost increases, while requiring that they lower prices to reflect productivity gains. Since its first introduction in 1984 in Britain, price cap regulation has become the preferred form of rules-based price regulation around the world (Hank Intven and McCarthy Tetrault, ed., Telecommunications Handbook, page 4-9).

In establishing a price cap regime, the services earmarked for price cap regulation are grouped into service baskets. A price index (actual price index) consisting of a weighted average of the operator's existing prices (of rate elements) is computed for each service basket. Each actual price index (API) is matched with a price cap index (PCI). For the initial year of the regime, the PCI is set at an initial level and for subsequent years it is adjusted by several possible factors including an inflation factor a productivity factor, and quality of service factor. A price cap regime pertains to a specified number of years and may stipulate that at all times and for every change in the price of a rate element the API must not exceed the PCI. Besides this basic structure, the price cap model can be further fine tuned. For example, to prevent operators from pricing low in the services where competition is anticipated thereby preempting entry, and pricing high in services where a monopoly is likely to remain, limits can be imposed on the magnitude by which prices of individual services in a service basket can change during a given time period.

In its advisory and policy support role, ECTEL was charged with the responsibility of preparing the price cap regime. This paper discusses the issues surrounding the preparation and application of a price cap regime in ECTEL countries, and documents the specific mechanism and parameters of the price cap regime that ECTEL is recommending for implementation.

Price Cap Specification:

The basic price cap formula for a service basket is given as:

1. $API_{k} \leq PCI_{k}$

where API_{k} is the actual price index of the kth service basket in year t, and PCI_{k} is the price cap index for the kth service basket in year t. Equation 1 implies that the average price index (API_{k}) in any given time period must always be less or equal to the price cap index (PCI_{k}) for that period. The API_{k}, which is a weighted average of the prices of the rate elements falling in a service basket, can be computed as:

2. $$API_{k} = \sum_{i} \frac{p_{k}^{r_{k}}}{\Sigma r_{k}}$$

where the summation(Σ) is over all price cap rate elements in the kth service basket, p_{k} is the price of the ith price cap rate element in the kth service basket, and r_{k} is the accompanying revenue. For the first year of the price cap regime, PCI_{k} is set at an initial level and in subsequent years it is adjusted in accordance with a PCI formula that could be written as:

3. $PCI_{k} = PCI_{k-1}(1 + It - X \mp Q)$

where PCI_{k-1} is the price cap index of the kth service basket in the previous year (t-1), It (the inflation factor) is a measure of the existing inflation rate, X (the productivity factor) is a measure meant to capture the productivity of the regulated sector, and Q is the quality of service factor (QoS) intended to capture changes in the operator's quality of service. The price cap index formula specified in Equation 3, states that the PCI_{k} in a given year will be equal to the PCI in the previous year (PCI_{k-1}), plus the product of the previous year's PCI and the inflation factor, minus the product of the previous year's PCI and the productivity factor and plus or minus the product of the previous year's PCI and the QoS factor.

Price Cap Implementation:

To implement the price cap mechanism presented above, the regulator would need to decide on a number of issues, including the appropriate duration for the initial price cap regime, the grouping of services into service baskets, the selection of initial price cap indexes, the magnitude of the productivity factor, the construction of the quality of service factor, and the price index to use for the inflation factor.

Service Baskets. In deciding on the services to include in the price cap regime and the grouping of

these services into service baskets, ECTEL considered how much effective competition existed or was imminent in the market segment, whether the segment could be considered a basic or essential telecommunication service, and how critical the segment was to enabling liberalization and encouraging new entrants into the industry. Segments such as cellular and internet services and the CPE market, where competition already existed or where effective competition was anticipated, and which have already been removed from the list of regulated services, were not included in the price cap regime. Interconnection is critical to the liberalization process, however, its regulation is addressed under other provisions, therefore it too was left out of the proposed price cap regime. The services that ECTEL proposed for price cap regulation included data services, basic telephone services and OECS long distance telephone services. These services were grouped into three service baskets, namely **Business Basic Services** (access services, local calls, domestic fixed to mobile, and OECS long distance calls); **Residential Basic Services** (access services, local calls, domestic fixed to mobile, OECS long distance calls, directory inquiry, coin pay phones and public phone cards); and **Other Services** (dedicated leased lines, ISDN, packet network services, direct connect, xDSL services). The specific rate elements that fall under each service and service basket are detailed in Appendix A.

Price Cap Time Period. Price cap regulation requires a decision on the duration of the price cap regime. Longer price cap periods create greater market certainty, furnish regulators with more data points to evaluate the success of the regulation, and provide operators with stronger incentives to improve productivity, since they are more likely to keep cost savings. Shorter periods allow more timely adjustments to the price cap regime, but may discourage productivity improvements because of the likelihood that at the end of the price cap period operators would be asked to return cost savings to consumers. ECTEL recommends an initial period of three years, which we believe is long enough to generate sufficient information for ECTEL and the NTRCs to properly evaluate the effectiveness of the price cap regime and for the operator to still have an incentive to engage in productivity improvements, yet short enough to limit the undesirable consequences of an initial price cap regime that may be in need of adjustment.

Productivity Factor. The productivity factor is one of the most critical parameters of price cap regulation. Its inclusion in the formulation of the PCI allows the operator to pass on productivity gains to consumers in the form of lower prices, yet gives the operator an incentive to improve its productivity, because productivity gains (cost savings) in excess of the productivity factor can be kept as increased profit. The greater the productivity factor, the lower the prices that consumers will enjoy, but the least profitable the business will be to the operator and the least attractive it will be to potential entrants. The productivity factor is usually based on the Total Factor Productivity Index (TFP). However, the index is not available for any of the ECTEL countries, and the data requirements for computing it is prohibitive. Therefore, it is recommended that the productivity factor be benchmarked. The productivity factor of other national price cap plans that we looked at ranged from 1.1 percent to 7.5 percent (Table 1). It is recommended (Hank Intven and McCarthy Tetrault, ed., Telecommunications Handbook, page 4-9) that, rather than starting with a productivity factor that is too optimistic, which may stifle efficiency and preclude entry into the industry, the very properties that price cap regulation is suppose to promote, one should begin with a conservative

value, which, if it turns out to be too low, could be increased in future price cap regimes. In light of this we believe that for the initial price cap regime a productivity factor of 2 percent is both prudent and conservative.

Table 1. Productivity Bench Marking

Country	Productivity Factor (%)	Price Cap Coverage
Argentina	5.5	basic services
Australia	7.5	basic and mobile services
Canada	4.5	basic and local services
Chile	1.1	local and access services
Colombia	2.0	local services
Denmark	4.0	basic and ISDN services
France	4.5	basic services
Ireland	6.0	basic and ISDN services
Mexico	3.0	basic services
Portugal	4.0	basic and leased line services
UK	4.5	basic residential
US	6.5	interstate access services
Jamaica	6.0	basic services

Service Quality Factor

Because price cap regulation allows the operator to keep cost savings in excess of the productivity factor there is an incentive for the operator to reduce cost at the expense of service quality. To safeguard against or account for this phenomenon, a service quality factor could be included in the formulation of the price cap index that would cause the price cap index to decrease (thus forcing the operator to reduce prices) when the quality of the operator's services falls below acceptable levels. One way of quantifying the quality of service or obtaining a quality of service index is to have the operator summit a monthly service performance report. The various performance dimensions of the report can then be graded, and if in total the operator fails to register a passing grade, the price cap index would be reduced by a predetermined percentage. Table 2 presents an example of such a performance report adopted from Rhode Island's Price Cap Regime. With this report, ECTEL would need to determine what is a passing grade. Each month that the operator performs below the passing grade, the service quality factor would increase say by .0417. Hence, if the operator did not register a passing grade in six months of the previous twelve months, the following year the service quality factor would increase by 0.25 percent (6 x 0.0417), and the price cap index and hence the operator's prices would need to decrease accordingly.

Price Indexes. As implied above, the application of a price cap regime involves the use of three different price indexes. An inflation index (CPI, for example), the actual price index (API), and the price cap index (PCI). In ECTEL's case, establishing a price cap regime is further complicated since

it involves several countries, each with potentially a different cost structure, its own computation of inflation, and its own schedule of telecommunication prices. Yet to minimize administrative cost and reduce the opportunity for cross-subsidy, it is recommended that price caps be applied uniformly across ECTEL countries (Martin Taschdjian). This, however, necessitates the use of price indexes (CPI, API, and PCI) common to these countries. To obtain uniform price indexes, the study computed weighted average price indexes, where the weights were each country's share of ECTEL countries total GDP.

Table 2. Construction of Service Quality Factor Index

Activities	**Performance Criterion**	**Grade**
New installation orders not completed within 5 working days (%)	<12 12-13.99 ≥14	2 1 0
Installation appointments missed (%)	<2.5 2.5 - 3.49 ≥3.5	2 1 0
Line out of service > 24 hours (%)	<40 40 - 44.99 ≥45	4 2 0
Repeat repair reports (%)	<11 11 - 13.99 ≥14	2 1 0
Repair service answer time (sec)	<14 14 - 16.99 ≥ 17	4 2 0
Directory assistance answer time (sec)	< 4 4 - 5.99 ≥6	2 1 0
Average duration time - special access 1.5 Mbps Circuits (hours)	<2.5 2.5 - 4.49 ≥4.49	2 1 0
Customer trouble reports per 100 lines	<4 4 - 4.99 ≥ 5	2 1 0
Total Possible points/Month		20

The Construction of ECTEL Price Indexes. The study employed the inflation rate associated with the consumer price index (CPI) as the inflation factor in the price cap equation. The weighted average of ECTEL countries' inflation rates can be specified as:

$$4. \qquad CPI_t = \sum_j CPI_j \, (GDP_{j-1} / GDP_{t-1})$$

where the summation (Σ) is over the ECTEL countries, CPI_t is the weighted average of the consumer price indexes of ECTEL countries in the current year, CPI_j is the consumer price index of the jth ECTEL country in the current year, GDP_{j-1} is the jth country's GDP in the previous year, and GDP_{t-1} is the total GDP of ECTEL countries in the previous year.

The weighted average of the actual price indexes is presented below as:

$$5. \qquad \overline{API}_k = \sum_j API_{jk} \, (GDP_{j-1} / GDP_{t-1})$$

where $\overline{API}_k$ is the weighted average of the actual price index for the kth service basket; API_{jk} is the actual price index in the jth ECTEL country, for the kth service basket, computed as in Equation 2.

Similarly, the weighted average of ECTEL countries' price cap index is given as:

$$6. \qquad PCI_k = \sum_j PCI_{jk} \, (GDP_{j-1} / GDP_{t-1})$$

where PCI_k is the weighted average of the price cap index for the kth service basket; PCI_{jk} is the price cap index in the jth ECTEL country, for the kth service basket, computed as in Equation 3. In the initial year of the price cap regime the PCI for each service basket will be set to an initial value and in subsequent years it will be adjusted as in Equation 3, 4 and 6.

Data and Computation:

Rates, usage and revenue data for the computations were obtained from Cable & Wireless. Consumer price index and GDP data were obtained from the ECCB. The revenues used as weights in the construction of the price indexes were based on June 2002 data. At the time that the data was requested from C&W this was the only available month of data that reflected the new set of prices established June 1, 2002. The analysis presented here doesn't include St. Kitts because to date C&W St. Kitts hasn't submitted any of the requested data. Also, the analysis did not include the other (data) services because the data received on these services were mostly incomplete. Further, it was only lately that we decided to include coin pay phones, public phone cards and directory inquiry in the residential basic service basket. Consequently, data on these services were not included in the initial data request to C&W. Therefore, these services could not be included in the present analysis.

Table 3. C&W Actual Price Indexes (API)

Service Baskets	ECTEL	St. Lucia	St. Vincent	Grenada	Dominica	St. Kitts
Res Basic Service	6.78	5.60	6.57	9.45	5.87	-
Bus Basic Service	4.78	3.35	7.22	5.70	3.46	-
Data Services	-	-	-	-	-	-

The initial price cap regime is expected to span a period of three years, possibly starting November 1, 2002 and ending October 31, 2005. The actual price indexes (API), computed as in Equation 2 and 5, are presented in Table 3. The computations yielded an ECTEL API value of 6.78 for the basic residential service basket, and a value of 4.78 for the basic business service basket.

For the first year of the regime, the price cap indexes need to be set at initial values. As recent as June 2002, C&W introduced a schedule of prices (covering the services included in the basic residential and basic business service baskets) that was arrived at through negotiations with ECTEL countries. These rates could be the starting point for the price cap regime. Meaning, that for the first year of the regime, the PCIs for the basic business and basic residential service baskets may be set equal to their corresponding APIs. For the other (namely data) services, we will investigate the cost of provision and then determine to what extent existing prices are reasonable and set the initial PCI value accordingly.

Table 4. ECTEL Price Cap Regime Second Year Simulation Results

	Year One	Year Two		
Activities	X-Factor = 0%	X-Factor = 2%	X-Factor = 5%	X-Factor = 7%
Inflation Factor	0.00%	2%	2%	2%
Quality Factor	0.00%	0.00%	0.00%	0.00%
Res PCI	6.78	6.78	6.58	6.44
Bus PCI	4.78	4.78	4.64	4.54

Table 4 presents a simulated scenario of the price cap indexes for the second year (November 1, 2003 to October 30, 2004) of the price cap regime. The computations set the quality of service factor at 0 percent and assumes that the inflation rate in the second year will be the same as in the previous year. Thus, in accordance with equation 3 and 6, and with a productivity factor of 2 percent, in year two of the price cap regime we obtain a PCI of 6.78 for the basic residential service basket and 4.78 for the basic business service basket. Notice that this was the same as obtained in year one because the inflation factor (2 percent) exactly offset the productivity factor. In comparison, with a productivity factor of 5 percent, the PCIs for the basic residential and basic business baskets decreased, respectively, to 6.58 and 4.64. And with a productivity factor of 7 percent, the PCIs decline further to 6.44 and 4.54. The lower the PCI, the more C&W has to lower its prices to comply with the price cap formulation.

The above analysis is preliminary. However, it points to two important policy decisions that has to be made before the price cap regime can be implemented. First, the level of the price cap indexes for the initial year; and second, the size of the productivity factor. Both decisions will impact on the magnitude of price decreases that C&W will have to implement for its prices to remain under the price cap indexes.

Issues Not Dealt With In This Analysis

1. The amount or percentage by which individual rate elements within a service basket will be allowed to change in any given year, and the amount or percentage by which the actual price indexes of the service baskets will be allowed to change in any given year.

2. The frequency with which the weights used to construct the actual price indexes will be adjusted. Should they be adjusted at the beginning of each year, or only at the beginning of each price cap regime (implying an adjustment every three years)?

Appendix A. Services and Service Baskets Under Price Cap Regulation

Basic Services-Business

Access Services

- Line rental
- Installation
- reconnection

Local Calls

- Day
- Evening
- Weekend

Domestic Fixed to Mobile

OECS Long Distance Calls (Calls among OECS countries)

- Calls among ECTEL States
- Calls b/w ECTEL States and Non-ECTEL OECS States

Basic Services-Residential

Access Services

- Line rental
- Installation
- reconnection

Local Calls

- Day
- Evening
- Weekend

Domestic Fixed to Mobile

OECS Long Distance Calls (Calls among OECS countries)

- Calls among ECTEL States
- Calls b/w ECTEL States and Non-ECTEL OECS States

Coin Pay Phones

Public Phone Cards

Directory Inquiry

Other Services

Dedicated Leased Lines

- Installation
- Monthly Rental

ISDN

- Installation
- Monthly Rental

Packet Network Services (Frame Relay, X.25)

- Installation
- Monthly Rental

xDSL

- Installation
- Monthly Rental

Direct Connect

- Installation
- Monthly Rental